IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Examiner: M. Jagan
VOLKER SCHMIDT	Art Unit: 2859
Application No.: 08/836,369	APPELLANT'S BRIEF UNDER 37 C.F.R. § 41.37
Filed: October 20, 1997	
For: TEMPERATURE-MEASUREMENT INSTRUMENT WITH DIFFRACTIVE OPTICS	

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

The following is appellant's Appeal Brief submitted in triplicate pursuant to 37 CFR 41.37(a). Appellants reserve the right to request an oral hearing pursuant to 37 CFR 41.47 following receipt of the Examiner's Answer.

REAL PARTY IN INTEREST:

RAYTEK, INC. is the real party in interest as the assignee of the above-identified application.

RELATED APPEALS AND INTERFERENCES:

No other appeals or interferences are known which will directly affect or be affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS:

Claims 1, 3 and 82 remain pending in this application and have been finally rejected. Appellant appeals the final rejection of claims 1, 3 and 82.

STATUS OF AMENDMENTS:

No amendments have been filed subsequent to the final rejection.

SUMMARY OF THE CLAIMED SUBJECT MATTER:

The present invention, as defined, for example, in claim 1, includes a sighting arrangement having a laser aligned to illuminate a diffractive optical system to provide a diffraction pattern in the form of a light intensity distribution to identify and outline the size of the measurement spot by means of visible light. Examples of the patterns generated are depicted in Figs. 2c, 2e, 2d, 2g and 3e.

GROUNDS OF REJECTION:

The USPTO issued a final rejection of claims 1 and 82 (mailed 09/02/2004) under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,368,392 to Hollander (hereinafter "Hollander") in view of the publication titled "Unique Applications of Computer-Generated Diffractive Optical Elements" by Mokry (hereinafter "Mokry").

Claim 3 is rejected in the final rejection under 35 U.S.C. §103(a) as being unpatentable over Hollander and Mokry as applied to claims 1 and 82 above, and further in view of the prior art disclosed in U.S. Patent 5,477,383 to Jain.

The Cited References

1. Hollander

The reference Hollander discloses a radiometer with a laser sighting arrangement for outlining only the periphery of the energy zone imaged onto the IR sensor. For example, Figs. 2, 3, 4, 6, and 10 depict complicated mechanical devices for manipulating the laser optics to form a continuous circle outlining only the periphery of the energy zone. Fig. 2 depicts a two-component laser for generating separate beams outlining only the periphery of the energy zone. Fig. 10 depicts a beamsplitter including a bundle of fibers for generating a plurality of spots outlining only the periphery of the energy zone. Only Figs. 2 and 10 depict structures for splitting a laser beam into components.

2. Mokry

Mokry addresses several aspects of diffractive optical elements which it states are emerging as planar, lightweight, low-cost replacements for many glass components in optical systems. (Introduction). Mokry describes two applications using a diffractive optical element (DOE).

In paragraph 4.1 the DOE is used as a collimating lens with an infrared diode in a servo system such as a floppy disk drive.

In paragraph 4.2 the DOE is used as a beamsplitter in a compact disk player where the zero and first diffractive orders are used to produce a position error signal for the head.

The Examiner's Reasoning

With regard to claims 1 and 82, the examiner states that Hollander discloses a device for temperature measuring comprising:

a radiometer having a detector and an optical system for imaging the heat radiation emanating from a measurement spot onto the detector; and

a sighting arrangement having a laser aligned to illuminate an optical system to produce a light pattern that identifies and outlines the position and size of the measurement spot by means of visible light; wherein the optical system generates a circular arrangement of more than two beams to outline and identify the energy zone.

It is also stated that Hollander does not disclose that the optical system of the sighting arrangement is a diffractive optical element.

It is further stated that Mokry discloses that diffractive optical systems formed by a diffractive element are commonly used in the art as laser beamsplitters and teaches that using a diffractive optical system as a laser beamsplitter in place of many conventional components in optical systems is beneficial since the diffractive optical system is more lightweight and less costly (abstract; lines 1-4 of section 1 ("Introduction"); lines 1-3 of section 4.2 ("DOE As Beamsplitter") and section 5 ("Conclusions").

It is concluded that, referring to claim 1, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device disclosed by Hollander by replacing the beamsplitter optical system with a diffractive optical

system, as disclosed by Mokry, in order to make the device lighter in weight and less costly to manufacture.

ARGUMENT:

1. Summary of the Argument

A. All limitations of claim 1 are not taught by the cited references as required in MPEP §2143.03.

B. The proposed modification would change the principle of operation of the reference in contradiction of MPEP §2143.01.

C. The cited prior art does not suggest the desirability of the claimed combination as required by MPEP §2143.01

2. Statement of the Arguments

A. **All the Limitations of Claim 1 are not Taught by the Cited References.**

MPEP §2143.03 requires that all claim limitations must be taught or suggested by the cited references. The cited references do not teach or suggest "a sighting arrangement having a laser aligned to illuminate a diffractive optical system to produce a diffraction pattern in the form of light intensity distribution for identifying and outlining the position and size of the measurement spot on the object of measurement by means of visible light" as recited in claim 1.

The office action acknowledges that Hollander does not teach a diffractive optical element utilized in the sighting arrangement.

The diffractive optical element used as a beamsplitter in Mokry generates the diffraction pattern depicted in Fig. 14 of Mokry that includes at least zero and first diffractive orders. (Mokry, Sec. 4.2). Several energy zone shapes are illustrated in Hollander, e.g., at Figs. 4, 9A-9C, and 10. The diffraction patterns generated by the diffractive element taught by Mokry are not capable of meeting the claim limitation that the diffraction pattern identifies and outlines the position and size of the measurement spot.

Accordingly, all the claim limitations are not taught or suggested by the cited references.

B. **The Proposed Modification of Incorporating the Diffractive Optical Element of Mokry into the Radiometer of Hollander Would Change the Principle of Operation of Hollander.**

MPEP §2143.01 requires that a prima facie case of obviousness is not established if the proposed modification would change the principle of operation of a reference.

The basic principle of operation of the Hollander reference is the projection of a fine laser line or lines against the surface being measured and positioning such line or lines so as to encompass the periphery of the energy zone E. (Hollander, col. 5, lines 22-26). Once the periphery of an energy zone is identified, the laser beam is then projected about the periphery of the energy zone E in accordance with the methods and apparatus described in the reference. (*Id.*, col. 5, lines 44-47). The apparatus claim 1 recites an apparatus that emits at least one laser beam and positions the laser beam about the energy zone to visibly outline only the periphery of the energy zone. (*Id.*, col. 8, lines 25-35, emphasis added).

Fig. 10 and the text at col. 7, lines 26-35 describe an embodiment utilizing a beamsplitter. The embodiment utilizes a plurality of optical fibers to project a plurality of fine laser lines to outline the periphery of the energy zone E.

The beamsplitter described in Mokry, at Section 4.2, and cited in the office action generates a diffraction pattern as shown in Fig. 14. It is stated in the text that the zero and first diffractive orders are used to produce an error signal.

If the diffractive optical element of Mokry were utilized in Hollander then the Hollander system could not operate to outline the periphery of the energy zone E. The diffractive pattern includes a first order spot and multiple lower orders that are incapable of outlining the periphery of an energy zone. Accordingly, the modification proposed in the office action changes the principle of operation of Hollander.

C. **There is No Teaching in the References Suggesting the Combination of the References.**

MPEP §2143.01 requires that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention only where there is some teaching or suggestion, or motivation to do so found either explicitly or

implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.

The Mokry reference teaches that diffractive optical elements are emerging as planar, lightweigh, low-cost replacements for many glass components in optical systems. It is stated in the office action that it would have been obvious to modify the device disclosed by Hollander by replacing the beamsplitter optical system with a diffractive optical system, as disclosed in Mokry, to make the device lighter in weight and less costly to manufacture.

The asserted motivation, while perhaps generally true, does not serve to motivate the combination in this case. In describing the diffractive optical element as a beam splitter in Sec. 4. 2, Mokry states "A DOE can be used as an effective beamsplitter in compact disk players, replacing the heavy, more expensive glass component". However, the beam splitter described in Hollander is a plurality of fixed optical fibers positioned to project a number of spots, not a heavy, expensive glass component as was the case in Mokry. (Hollander, col. 7, lines 29-30). There is no indication in Hollander that the beamsplitter contributes substantially to the weight of the radiometer or the cost of the radiometer. The conclusion of the office action that the substitution of the beamsplitter of Hollander with the diffractive optical element of Mokry would make the radiometer lighter and less expensive is speculation not based on the teachings of the references.

Thus, there is no teaching in the references suggesting the combination to a person of ordinary skill in the art. The quality of low-cost and light weight in Mokry is directed to the replacement of a glass optical component such as a heavy, expensive lens in a compact disk player. There is no teaching that similar advantages could be obtained by replacing the beamsplitter in Hollander.

Further, while low-cost and light weight may be general design goals, such goals are limited by the need for a device to perform its intended function. As described above, the diffractive optical element disclosed in Mokry does not perform required functions of Hollander.

Since there is no suggestion in the references of utilizing a diffractive optical system to generate a light pattern to define the energy zone, it is believed that the Office Action

is applying an obvious-to-try standard. The CAFC has postulated three situations that seem to lead to the conclusion that it would be obvious to try:

> 1) to vary all parameters or try each of numerous possible choices until one possibility arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful; 2) to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it; and 3) where the reference contained detailed enabling methodology for practicing the claimed invention, a suggestion to modify the prior art to practice the claimed invention, and evidence suggesting that it would be successful.

The first two situations result in nonobviousness, while the third does not. *In re O'Farrell*, 7 USPQ2d 1673 (CAFC 1988).

The present facts are similar to situation 2). Hollander suggests that two or more beams can be derived utilizing a beam splitter and discloses a beam splitter having discrete structures for forming each beam, in Fig. 5 the arms of the laser splitter and in Fig. 10 the multiple optical fibers. In the present application, the inventors explored a new technology that seemed to be a promising field of experimentation not suggested or taught by the reference.

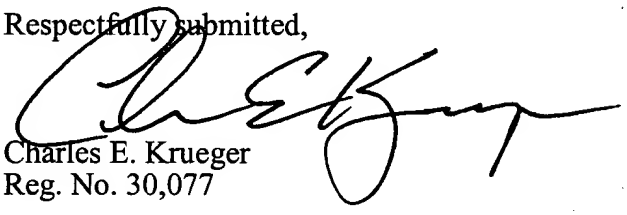
Accordingly, the general goal of making a device lightweight and low-cost is not sufficient to motivate the modification of a critical component of a device without additional teachings that the modification would enable the device to perform its intended function.

CONCLUSION:

None of the references disclose the features of the pending claims. The examiner has used the applicant's own disclosure as a guide to conclude that a diffractive optical system is equivalent to the beam splitter disclosed in Hollander.

In view of the above, it is respectfully asserted that the pending claims are patentable.

Respectfully submitted,



Charles E. Krueger
Reg. No. 30,077

LAW OFFICE OF CHARLES E. KRUEGER
P.O. BOX 5607
WALNUT CREEK, CALIFORNIA 94596
VOICE: (925) 944-3320 FAX (925) 944-3363

CLAIMS APPENDIX

1. Device for temperature measurement comprising:

a) a detector for receiving heat radiation emanating from a measurement spot on an object of measurement,

b) an optical system for imaging the heat radiation emanating from the measurement spot onto the detector

c) and a sighting arrangement having a laser aligned to illuminate a diffractive optical system to produce a diffraction pattern in the form of light intensity distribution for identifying and outlining the position and size of the measurement spot on the object of measurement by means of visible light.

3. Device as claimed in claim 1, wherein the diffractive optical system is formed by a holographic element.

82. The device of claim 1 where said diffractive optical system generates a circular arrangement of more that two beams to outline and identify the energy zone.